What Is Claimed Is:

1. A composition comprising a first oligomer and a second oligomer, wherein:

at least a portion of said first oligomer is capable of hybridizing with at least a portion of said second oligomer,

at least a portion of said first oligomer is complementary to and capable of hybridizing to a selected target nucleic acid, and

at least one of said first or second oligomers includes at least two nucleosides having a non-phosphorous-containing internucleoside linkage.

2. The composition of claim 1 wherein said first and said second oligomers are a complementary pair of siRNA oligomers.

3. The composition of claim 1 wherein said first and said second oligomers are an antisense/sense pair of oligomers.

4. The composition of claim 1 wherein each of said first and second oligomers has 12 to 50 nucleosidic bases.

5. The composition of claim 1 wherein each of said first and second oligomers has 15 to 30 nucleosidic bases.

6. The composition of claim 1 wherein each of said first and second oligomers has 21 to 24 nucleosidic bases.

7. The composition of claim 1 wherein said first oligomer is an antisense oligomer.

8. The composition of claim 7 wherein said second oligomer is a sense oligomer.

9. The composition of claim 7 wherein said second oligomer has a plurality of ribose nucleotide units.

10. The composition of claim 1 wherein said first oligomer includes said nucleosides having a non-phosphorous-containing internucleoside linkage.

11. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is an ether linkage of the formula -O-R_1-O- where R_1 is a group comprising a two or three carbon backbone.

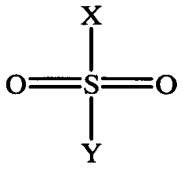
12. The composition of claim 11 wherein R_1 is an optionally substituted ethyl, ethylene, acetylene, cyclopropyl, cyclobutyl, ethylenoxy, ethylaziridine, aziridine, propyl, isopropyl, methyl-cyclopropyl, C3 through C6 carbocyclic, or 4-, 5-, or 6-membered nitrogen heterocyclic group.

13. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is an allyl ether linkage of the formula 2'/3'-O-CH_2CH=5' wherein a double bond is located between the 5' carbon atom and the adjacent substitute linkage atom.

14. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is an allyl sulfide linkage of the formula 2'/3'-S-CH_2-CH=5' wherein a double bond is located between the 5' carbon atom and the adjacent substitute linkage atom.

15. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is a formacetal/ketal linkage of the formula -YCX_2Y- wherein each Y is independently O or S and each X is -H, -F, -Cl, -Br, -NO_2, -SCH_2CH_3, -COOH, -$COOCH_3$, -$COOCH(CH_3)_2$, -$CONHCH_3$, -CH_2F, -CF_3, -CH_2COOCH_3, -$CH_2CONHCH_2CH_3$, -CH_2CH_2COOH, -$CH_2CH_2NH_2$, -$CH_2CH_2NHCH_2CH_3$, or -$CH_2CH_2CF_3$.

16. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is a sulfamate linkage of the formula:



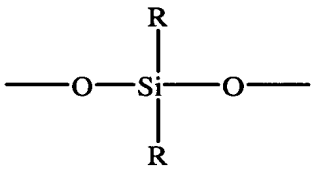
wherein X and Y are H or alkyl.

17. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is a sulfonamide linkage of one of the following formulas:

3'- NHR_3-SO_2-CH_2-5' or 3'- NHR_3-SO_2-CH=5'

wherein R_3 is hydrogen, C1-5 alkyl optionally substituted by amino or hydroxy, piperidinyl, piperazinyl, morpholinyl, phenyl, benzyl, allyl, acetyl, or benzoyl.

18. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is a siloxane linkage of the following formula:

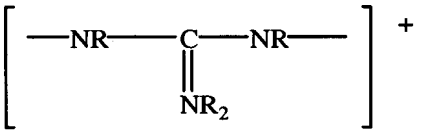


wherein each R is independently C1-C6 alkyl.

19. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is an amide or thioamide linkage of one of the following formulas: NR-C(O)-CH_2-CH_2, NR-C(S)-CH_2-CH_2, CH_2-NR-C(O)-CH_2, CH_2-NR-C(S)-CH_2, CH_2-CH_2-NR-C(O), CH_2-CH_2-NR-C(S), C(O)-NR-CH_2-CH_2, C(S)-NR-CH_2CH_2, CH_2-C(O)-NR-CH_2, and CH_2-C(S)-NR-CH_2 where R is hydrogen, alkyl, substituted alkyl, aralkyl, alkenyl, alkaryl, aminoalkyl, hydroxyalkyl, heterocycloalkyl, heterocycloaralkyl, an RNA cleaving group, a group for improving the affinity for the RNA complement, or a group for improving the pharmacodynamic properties of the oligomer.

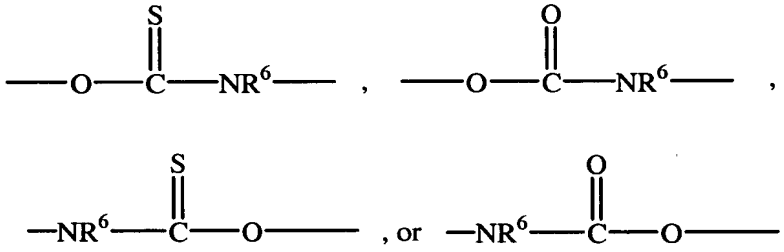
20. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is a cationic alkylpolyamine linkage selected from the group consisting of a dimethylamino propylamine linkage, a N, N-diaminopropylamine linkage, and a diethyethylinediamine linkage.

21. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is a guanidyl linkage of the following formula:



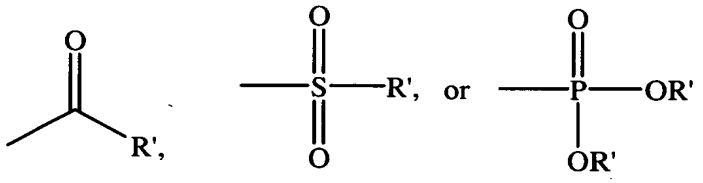
wherein R is a hydrogen atom, or a lower alkyl or phenyl group.

22. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is a linkage of one of the following formulas: -S-CH_2-CH_2-, -S-CH_2-, -O-CH_2-S-, -O-CH_2-O-, -CH_2-CH_2-S-, -CH_2-S-, -S-CH_2-O-,



wherein R^6 is lower alkyl, OMe, OH, heteroalkyl, or aryl.

23. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is a linkage of one of the following formulas: -CH_2-CH_2-NR-, -NR-CH_2-CH_2-, -CH_2-NR-CH_2-, -CH_2CH_2-CH_2-O-, -CH_2-O-CH_2-, -S-CH_2-CH_2-, or -O-CH_2-CH_2-NR-, wherein R is hydrogen, lower alkyl, heteroalkyl, aryl, sulfonamide, phosphoramidate, NR', OR',



and R' is hydrogen, lower alkyl, heteroalkyl, or aryl.

24. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is a linkage of the following formula:

-D-D-D-

where each D is independently CHR, oxygen or NR_6, wherein R is hydrogen, OH, SH or NH_2, R_6 is hydrogen or C_1-C_2 alkyl, and only one D is oxygen or NR_6.

25. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is a linkage of the following formula:

$-L_1-L_2-L_3-L_4-$

wherein L_1 and L_4 are optionally substituted carbon atoms and L_2 and L_3 are, independently, optionally substituted carbon atoms, oxygen atoms, nitrogen atoms, phosphorus atoms, sulfur atoms, or silicon atoms.

26. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is a linkage of the following formula:

$L_1-L_2-L_3-L_4$

wherein

L_1 and L_4 are, independently, CH_2, C=O, C=S, C-NH_2, C-NHR_3, C-OH, C-SH, C-O-R_1 or C-S-R_1;

L_2 and L_3 are, independently, CR_1R_2, $C=CR_1R_2$, $C=NR_3$, C=O, C=S, O, S, SO, SO_2, NR_3 or SiR_5R_6; or together form part of an alkene, alkyne, aromatic ring, carbocycle or heterocycle, and if L_1 is C=O or C=S then L_2 is not NR_3 or if L_4 is C=O or C=S then L_3 is not NR_3; or

L_1, L_2, L_3 and L_4 together comprise a -CH=N-NH-CH_2- or -CH_2-O-N=CH- moiety;

R_1 and R_2 are, independently, H; OH; SH; NH_2; C_1 to C_{10} alkyl, substituted alkyl, alkenyl, alkaryl or aralkyl; alkoxy; thioalkoxy; alkylamino; aralkylamino; substituted alkylamino; heterocycloalkyl; heterocycloalkylamino; aminoalkylamino; polyalkylamino; halo; formyl; keto; benzoxy; carboxamido; thiocarboxamido; ester; thioester; carboxamidine; carbamyl; ureido; guanidino; a group for improving the pharmacokinetic properties of an oligomer; or a group for improving the pharmacodynamic properties of an oligomer;

R_3 is H, OH, NH_2, lower alkyl, substituted lower alkyl, alkoxy, lower alkenyl, aralkyl, alkylamino, aralkylamino, substituted alkylamino, heterocycloalkyl, heterocycloalkylamino, aminoalkylamino, polyalkylamino, a group for improving the pharmacokinetic properties of an oligomer or a group for improving the pharmacodynamic properties of an oligomer; and

R_5 and R_6 are, independently, C_1 to C_6 alkyl or alkoxy.

27. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is a linkage of one of the following formulas:
CH_2-R_A-NR-CH_2, CH_2-NR-R_A-CH_2 , R_A-NR-CH_2-CH_2, CH_2-CH_2-NR-R_A, CH_2-CH_2-R_A- NR, NR-R_A-CH_2-CH_2, or NR-R_A-CH_2
wherein

R_A is O or NR and R is H; alkyl or substituted alkyl having 1 to about 10 carbon atoms; alkenyl or substituted alkenyl having 2 to about 10 carbon atoms; alkynyl or substituted alkynyl having 2 to about 10 carbon atoms; alkaryl, substituted alkaryl, aralkyl, or substituted aralkyl having 7 to about 14 carbon atoms; alicyclic; heterocyclic; a reporter molecule; a group for improving the pharmacokinetic properties of an oligomer; or a group for improving the pharmacodynamic properties of an oligomer.

28. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is a linkage of one of the following formulas:
-CH_2-NR_1-NR_2-CH_2- or -NR_1-NR_2-CH_2-CH_2-
wherein

R_1 and R_2 are the same or different and are H; alkyl or substituted alkyl having 1 to about 10 carbon atoms; alkenyl or substituted alkenyl having 2 to about 10 carbon atoms; alkynyl or substituted alkynyl having 2 to about 10 carbon atoms; alkaryl, substituted alkaryl, aralkyl, or substituted aralkyl having 7 to about 14 carbon atoms; alicyclic; heterocyclic; a reporter

molecule; a group for improving the pharmacokinetic properties of an oligomer; or a group for improving the pharmacodynamic properties of an oligomer.

29. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is a linkage of the following formula:

L_1-L_2-L_3-L_4

wherein

one of L_1 or L_2 is O or S, and the other of L_1 or L_2 is N-R, and combined L_3 and L_4 are CH_2, or L_3 is CH_2 and L_4 is CR'R";

one of L_3 or L_4 is O or S, and the other of L_3 or L_4 is N-R, and combined L_1 and L_2 are CH_2, or L_2 is CH_2 and L_1 is CR'R";

one of L_1 and L_4 is O, S or N-R, and the other of L_1 and L_4 is CR'R", and L_2 and L_3 are CH_2;

L_1, L_2, L_3 and L_4 together are O-N=CH-CH_2 or CH_2-CH=N-O;

L_1 is O, L_2 is N, L_3 is CH_2, and L_4 is C or CH, and together with at least two additional carbon or hetero atoms, L_2, L_3 and L_4 form a 5 or 6 membered ring; or

L_1 is C or CH, L_2 is CH_2, L_3 is N, and L_4 is O, and together with at least two additional carbon or hetero atoms, L_1, L_2 and L_3 form a 5 or 6 membered ring;

R is H; C_1 to C_{10} straight or branched chain lower alkyl or substituted lower alkyl; C_2 to C_{10} straight or branched chain lower alkenyl or substituted lower alkenyl; C_2 to C_{10} straight or branched chain lower alkynyl or substituted lower alkynyl; a ^{14}C containing lower alkyl, lower alkenyl or lower alkynyl; C_7 to C_{14} substituted or unsubstituted alkaryl or aralkyl; a ^{14}C containing C_7 to C_{14} alkaryl or aralkyl; alicyclic; heterocyclic; a reporter molecule; a group for improving the pharmacokinetic properties of an oligomer; or a group for improving the pharmacodynamic properties of an oligomer; and

R' and R" are H; or R' is H and R" is O-R; or combined R' and R" are =O.

30. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is a linkage of one of the following formulas:

$CR_{1a}R_{1b}$-$CR_{2a}R_{2b}$-$CR_{3a}R_{3b}$-Z_4, $CR_{1a}R_{1b}$-$CR_{2a}R_{2b}$-Z_3-Z_4, $CR_{1a}R_{1b}$-Z_2-$CR_{2a}R_{2b}$-Z_4, Z_1-$CR_{1a}R_{1b}$-$CR_{2a}R_{2b}$-Z_4, $CR_{1a}R_{1b}$-Z_2-Z_3-Z_4, Z_1-$CR_{2a}R_{2b}$-Z_3-Z_4, or Z_1-Z_2-$CR_{3a}R_{3b}$-Z_4

wherein

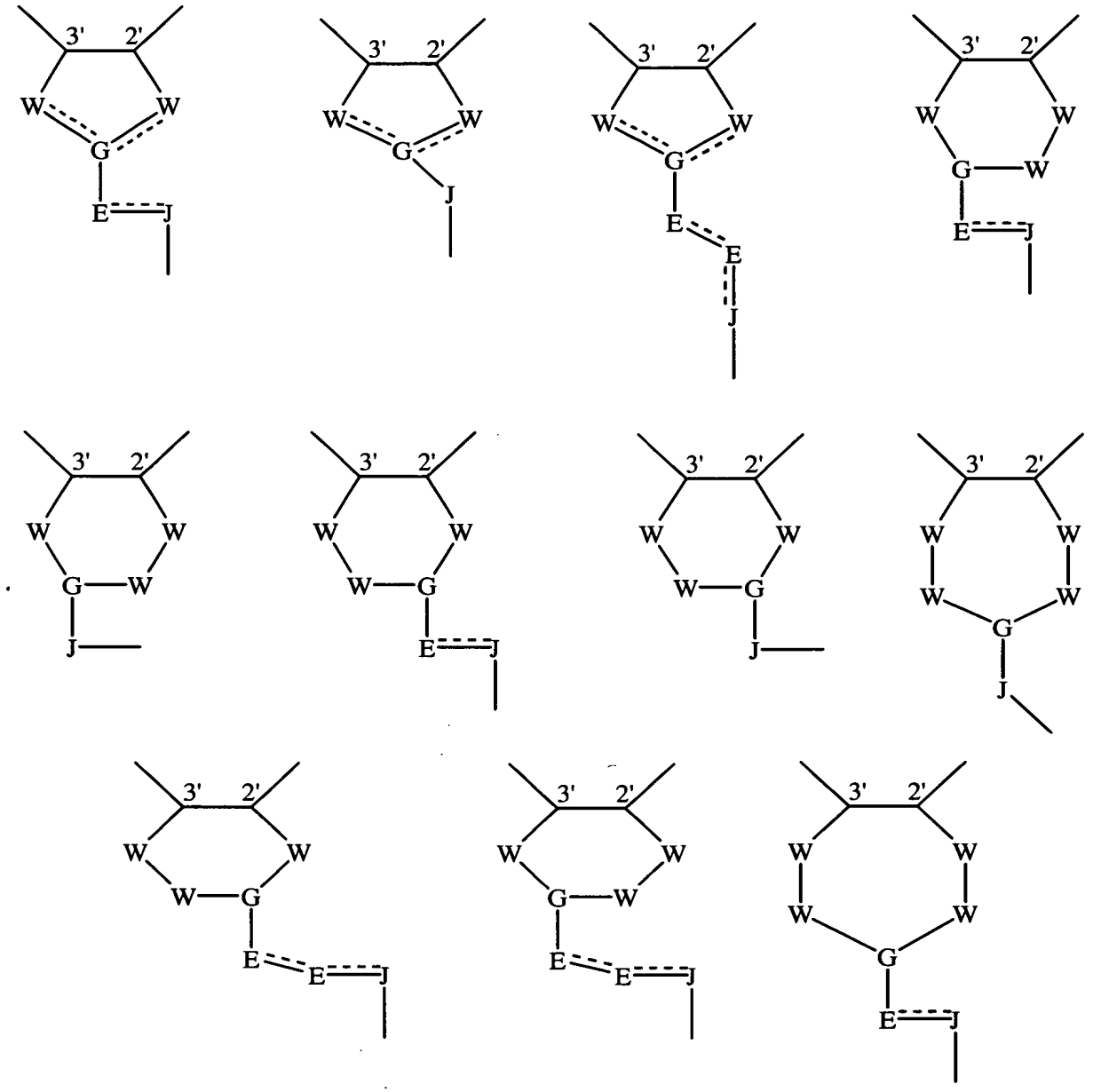
Z_1, Z_2, Z_3 and Z_4 are, independently, NR_4, S, SO, SO_2, Se, $Si(R_6)_2$, or O;

R_{1a}, R_{1b}, R_{2a}, R_{2b}, R_{3a} and R_{3b} are, independently, H, R_5, O-R_5, S-R_5, NR_4R_5; or, independently, together R_{1a} and R_{1b}, or R_{2a} and R_{2b}, or R_{3a} and R_{3b} are =O;

R_4, R_5 and R_6 are, independently, H; C_1 to C_{10} straight or branched chain lower alkyl or substituted lower alkyl; C_2 to C_{10} straight or branched chain lower alkenyl or substituted lower alkenyl; C_2 to C_{10} straight or branched chain lower alkynyl or substituted lower alkynyl; a ^{14}C containing lower alkyl, lower alkenyl or lower alkynyl; C_7 to C_{14} substituted or unsubstituted alkaryl or aralkyl; a ^{14}C containing C_7 to C_{14} alkaryl or aralkyl; C_6 to C_{14} aryl; alicyclic; heterocyclic; a reporter molecule; a group for improving the pharmacokinetic properties of an oligomer; or a group for improving the pharmacodynamic properties of an oligomer; and

where said substituents are OH, =O, CO_2 H, O-alkyl, SH, S-alkyl, NH-alkyl, N-$(alkyl)_2$, alkyl, F, Cl, Br, CN, CF_3, OCF_3, OCN, $SOCH_3$, SO_2CH_3, ONO_2, NO_2, N_3, NH_2, heterocycloalkyl, aryl, aralkyl, sulfide, silyl, intercalators, conjugates, imidazoles, amides, ester, ethers, carbonates, carbamates, ureas, polyamines, polyamides, polyethylene glycols or polyethers.

31. The composition of claim 1 wherein said non-phosphorous-containing internucleoside linkage is a linkage of one of the following formulas:



wherein

each W is independently selected from the group consisting of O, S, SO, SO_2, CH_2, CH, CO, CF_2, CS, N, NH and NR_3, and adjacent W's are not -O-O-, -O-S-, -O-CF_2-, or -S-CF_2-;

R_3 is methyl, ethyl, propyl, isopropyl, butyl or isobutyl;

each E is independently selected from the group consisting of O, S, SO, SO_2, CH, CH_2, CO, CF_2, CS, N, NH, and NR_3, and adjacent E's are not -O-O-, -O-S-, -S-O-, -O-CF_2-, -CF_2-O-, -CF_2-S- or -S-CF_2 -, and when E is CH or N, any adjacent E is CH or N or an adjacent J is CH and they are connected by a double bond;

J is selected from the group consisting of O, S, SO, SO_2, CH, CH_2, CO, CF_2 and CS, and adjacent -E-J-'s are not -O-O-, -O-S-, -S-O-, $-CF_2-O-$, $-O-CF_2-$, $-CF_2-S-$ or $-S-CF_2-$, and when J is CH, any adjacent E is CH or N and they are connected by a double bond;

each G is independently selected from the group consisting of C, CH, N, CF, CCl, CBr, CI, and CR_4;

R_4 is C1 to C4 alkyl, fluoromethyl, difluoromethyl, trifluoromethyl, hexafluoroisopropyl, 5-tetrazole, hydroxymethyl, CH_2-(5-tetrazole), CN, CO_2H, CO_2R_3, $CONH_2$, $CONHR_3$, $CON(R_3)_2$, CH_2SR_3, CH_2SOR_3, $CH_2SO_2R_3$, CH_2CO_2H, CH_2CN, $CH_2CO_2R_3$, CH_2CONH_2, CH_2CONHR_3 or $CH_2CON(R_3)_2$.

32. A pharmaceutical composition comprising the composition of claim 1 and a pharmaceutically acceptable carrier.

33. A method of modulating the expression of a target nucleic acid in a cell comprising contacting said cell with a composition of claim 1.

34. A method of treating or preventing a disease or disorder associated with a target nucleic acid comprising administering to an animal having or predisposed to said disease or disorder a therapeutically effective amount of a composition of claim 1.

35. A composition comprising an oligomer complementary to and capable of hybridizing to a selected target nucleic acid and at least one protein, said protein comprising at least a portion of a RNA-induced silencing complex (RISC), wherein:

said oligomer includes at least two nucleosides having a non-phosphorous-containing internucleoside linkage.

36. The composition of claim 35 wherein said oligomer is an antisense oligomer.

37. The composition of claim 35 wherein said oligomer has 12 to 50 nucleosic bases.

38. The composition of claim 35 wherein said oligomer has 15 to 30 nucleosidic bases.

39. The composition of claim 35 wherein said oligomer has 21 to 24 nucleosidic bases.

40. The composition of claim 35 further including a further oligomer, wherein said further oligomer is complementary to and hydrizable to said oligomer.

41. The composition of claim 40 wherein said further oligomer is a sense oligomer.

42. The composition of claim 40 wherein said further oligomer is an oligomer having a plurality of ribose nucleoside units.

43. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is an ether linkage of the formula -O-R_1-O- where R_1 is a group comprising a two or three carbon backbone.

44. The composition of claim 43 wherein R_1 is an optionally substituted ethyl, ethylene, acetylene, cyclopropyl, cyclobutyl, ethylenoxy, ethylaziridine, aziridine, propyl, isopropyl, methyl-cyclopropyl, C3 through C6 carbocyclic, or 4-, 5-, or 6-membered nitrogen heterocyclic group.

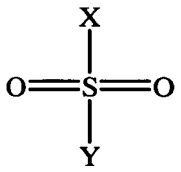
45. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is an allyl ether linkage of the formula 2'/3'-O-CH_2CH=5' wherein a double bond is located between the 5' carbon atom and the adjacent substitute linkage atom.

46. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is an allyl sulfide linkage of the formula 2'/3'-S-CH_2-CH=5' wherein a double bond is located between the 5' carbon atom and the adjacent substitute linkage atom.

47. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is a formacetal/ketal linkage of the formula -YCX_2Y- wherein each Y is independently O or S and each X is -H, -F, -Cl, -Br, -NO_2, -SCH_2CH_3, -COOH, -$COOCH_3$, -$COOCH(CH_3)_2$, -$CONHCH_3$, -CH_2F, -CF_3, -CH_2COOCH_3, -$CH_2CONHCH_2CH_3$, -CH_2CH_2COOH, -$CH_2CH_2NH_2$,

$-CH_2CH_2NHCH_2CH_3$, or $-CH_2CH_2CF_3$.

48. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is a sulfamate linkage of the formula:



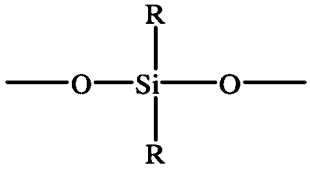
wherein X and Y are H or alkyl.

49. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is a sulfonamide linkage of one of the following formulas:

3'- NHR_3-SO_2-CH_2-5' or 3'- NHR_3-SO_2-CH=5'

wherein R_3 is hydrogen, C1-5 alkyl optionally substituted by amino or hydroxy, piperidinyl, piperazinyl, morpholinyl, phenyl, benzyl, allyl, acetyl, or benzoyl.

50. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is a siloxane linkage of the following formula:



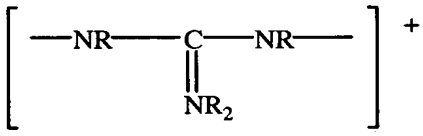
wherein each R is independently C1-C6 alkyl.

51. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is an amide linkage of one of the following formulas: NR-C(O)-CH_2-CH_2, NR-C(S)-CH_2-CH_2, CH_2-NR-C(O)-CH_2, CH_2-NR-C(S)-CH_2, CH_2-CH_2-NR-C(O), CH_2-CH_2-NR-C(S), C(O)-NR-CH_2-CH_2, C(S)-NR-CH_2CH_2, CH_2-C(O)-NR-CH_2, and CH_2-C(S)-NR-CH_2 where R is

hydrogen, alkyl, substituted alkyl, aralkyl, alkenyl, alkaryl, aminoalkyl, hydroxyalkyl, heterocycloalkyl, heterocycloaralkyl, a group for improving the affinity for the RNA complement, or a group for improving the pharmacodynamic properties of the oligomer.

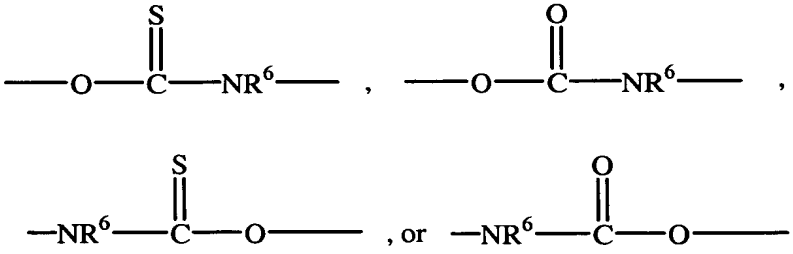
52. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is a cationic alkylpolyamide linkage selected from the group consisting of a dimethylamino propylamine linkage, a N, N-diaminopropylamine linkage, and a diethyethylinediamine linkage.

53. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is a guanidyl linkage of the following formula:



wherein R is a hydrogen atom, or a lower alkyl or phenyl group.

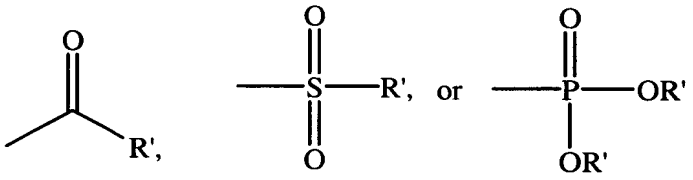
54. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is a linkage of one of the following formulas: -S-CH_2-CH_2-, -S-CH_2-, -O-CH_2-S-, -O-CH_2-O-, -CH_2-CH_2-S-, -CH_2-S-, -S-CH_2-O-,



wherein R^6 is lower alkyl, OMe, OH, heteroalkyl, or aryl.

55. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is a linkage of one of the following formulas: -CH_2-CH_2-NR-, -NR-CH_2-CH_2-, -CH_2-

$NR-CH_2-$, $-CH_2CH_2-CH_2-O-$, $-CH_2-O-CH_2-$, $-S-CH_2-CH_2-$, or $-O-CH_2-CH_2-NR-$, wherein R is hydrogen, lower alkyl, heteroalkyl, aryl, sulfonamide, phosphoramidate, NR', OR',



and R' is hydrogen, lower alkyl, heteroalkyl, or aryl.

56. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is a linkage of the following formula:

-D-D-D-

where each D is independently CHR, oxygen or NR_6, wherein R is hydrogen, OH, SH or NH_2, R_6 is hydrogen or C_1-C_2 alkyl, and only one D is oxygen or NR_6.

57. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is a linkage of the following formula:

$-L_1-L_2-L_3-L_4-$

wherein L_1 and L_4 are optionally substituted carbon atoms and L_2 and L_3 are, independently, optionally substituted carbon atoms, oxygen atoms, nitrogen atoms, sulfur atoms, or silicon atoms.

58. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is a linkage of the following formula:

$L_1-L_2-L_3-L_4$

wherein

L_1 and L_4 are, independently, CH_2, C=O, C=S, $C-NH_2$, $C-NHR_3$, C-OH, C-SH, $C-O-R_1$ or $C-S-R_1$;

L_2 and L_3 are, independently, CR_1R_2, $C=CR_1R_2$, $C=NR_3$, C=O, C=S, O, S, SO, SO_2, NR_3 or SiR_5R_6; or together form part of an alkene, alkyne, aromatic ring, carbocycle or heterocycle, and if L_1 is C=O or C=S then L_2 is not NR_3 or if L_4 is C=O or C=S then L_3 is not NR_3; or

L_1, L_2, L_3 and L_4 together comprise a -CH=N-NH-CH_2- or -CH_2-O-N=CH- moiety;

R_1 and R_2 are, independently, H; OH; SH; NH_2; C_1 to C_{10} alkyl, substituted alkyl, alkenyl, alkaryl or aralkyl; alkoxy; thioalkoxy; alkylamino; aralkylamino; substituted alkylamino; heterocycloalkyl; heterocycloalkylamino; aminoalkylamino; polyalkylamino; halo; formyl; keto; benzoxy; carboxamido; thiocarboxamido; ester; thioester; carboxamidine; carbamyl; ureido; guanidino; a group for improving the pharmacokinetic properties of an oligomer; or a group for improving the pharmacodynamic properties of an oligomer;

R_3 is H, OH, NH_2, lower alkyl, substituted lower alkyl, alkoxy, lower alkenyl, aralkyl, alkylamino, aralkylamino, substituted alkylamino, heterocycloalkyl, heterocycloalkylamino, aminoalkylamino, polyalkylamino, a group for improving the pharmacokinetic properties of an oligomer or a group for improving the pharmacodynamic properties of an oligomer; and

R_5 and R_6 are, independently, C_1 to C_6 alkyl or alkoxy.

59. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is a linkage of one of the following formulas:
CH_2-R_A-NR-CH_2, CH_2-NR-R_A-CH_2, R_A-NR-CH_2-CH_2, CH_2-CH_2-NR-R_A, CH_2-CH_2-R_A- NR, NR-R_A-CH_2-CH_2, or NR-R_A-CH_2
where

R_A is O or NR and R is H; alkyl or substituted alkyl having 1 to about 10 carbon atoms; alkenyl or substituted alkenyl having 2 to about 10 carbon atoms; alkynyl or substituted alkynyl having 2 to about 10 carbon atoms; alkaryl, substituted alkaryl, aralkyl, or substituted aralkyl having 7 to about 14 carbon atoms; alicyclic; heterocyclic; a reporter molecule; a group for improving the pharmacokinetic properties of an oligomer; or a group for improving the pharmacodynamic properties of an oligomer.

60. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is a linkage of one of the following formulas:
-CH_2-NR_1-NR_2-CH_2- or -NR_1-NR_2-CH_2-CH_2-
wherein

R_1 and R_2 are the same or different and are H; alkyl or substituted alkyl having 1 to about 10 carbon atoms; alkenyl or substituted alkenyl having 2 to about 10 carbon atoms; alkynyl or substituted alkynyl having 2 to about 10 carbon atoms; alkaryl, substituted alkaryl, aralkyl, or

substituted aralkyl having 7 to about 14 carbon atoms; alicyclic; heterocyclic; a reporter molecule; a group for improving the pharmacokinetic properties of an oligomer; or a group for improving the pharmacodynamic properties of an oligomer.

61. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is a linkage of the following formula:

L_1-L_2-L_3-L_4

wherein

one of L_1 or L_2 is O or S, and the other of L_1 or L_2 is N-R, and combined L_3 and L_4 are CH_2, or L_3 is CH_2 and L_4 is CR'R";

one of L_3 or L_4 is O or S, and the other of L_3 or L_4 is N-R, and combined L_1 and L_2 are CH_2, or L_2 is CH_2 and L_1 is CR'R";

one of L_1 and L_4 is O, S or N-R, and the other of L_1 and L_4 is CR'R", and L_2 and L_3 are CH_2;

L_1, L_2, L_3 and L_4 together are O-N=CH-CH_2 or CH_2-CH=N-O;

L_1 is O, L_2 is N, L_3 is CH_2, and L_4 is C or CH, and together with at least two additional carbon or hetero atoms, L_2, L_3 and L_4 form a 5 or 6 membered ring; or

L_1 is C or CH, L_2 is CH_2, L_3 is N, and L_4 is O, and together with at least two additional carbon or hetero atoms, L_1, L_2 and L_3 form a 5 or 6 membered ring;

R is H; C_1 to C_{10} straight or branched chain lower alkyl or substituted lower alkyl; C_2 to C_{10} straight or branched chain lower alkenyl or substituted lower alkenyl; C_2 to C_{10} straight or branched chain lower alkynyl or substituted lower alkynyl; a ^{14}C containing lower alkyl, lower alkenyl or lower alkynyl; C_7 to C_{14} substituted or unsubstituted alkaryl or aralkyl; a ^{14}C containing C_7 to C_{14} alkaryl or aralkyl; alicyclic; heterocyclic; a reporter molecule; a group for improving the pharmacokinetic properties of an oligomer; or a group for improving the pharmacodynamic properties of an oligomer; and

R' and R" are H; or R' is H and R" is O-R; or combined R' and R" are =O.

62. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is a linkage of one of the following formulas:

$CR_{1a}R_{1b}$-$CR_{2a}R_{2b}$-$CR_{3a}R_{3b}$-Z_4, $CR_{1a}R_{1b}$-$CR_{2a}R_{2b}$-Z_3-Z_4, $CR_{1a}R_{1b}$-Z_2-$CR_{2a}R_{2b}$-Z_4, Z_1-$CR_{1a}R_{1b}$-$CR_{2a}R_{2b}$-Z_4, $CR_{1a}R_{1b}$-Z_2-Z_3-Z_4, Z_1-$CR_{2a}R_{2b}$-Z_3-Z_4, or Z_1-Z_2-$CR_{3a}R_{3b}$-Z_4 wherein

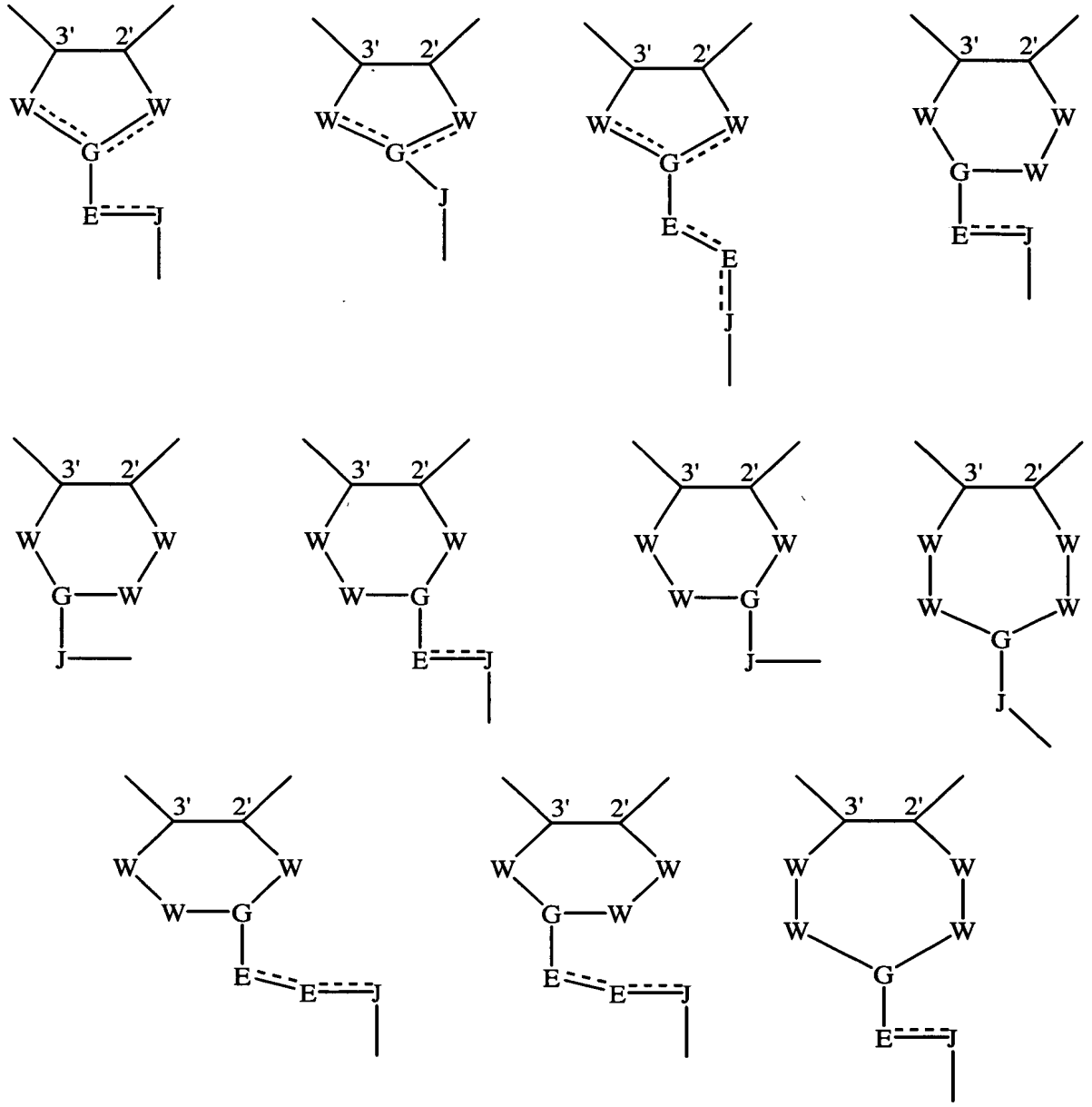
Z_1, Z_2, Z_3 and Z_4 are, independently, NR_4, S, SO, SO_2, Se, $Si(R_6)_2$, or O;

R_{1a}, R_{1b}, R_{2a}, R_{2b}, R_{3a} and R_{3b} are, independently, H, R_5, O-R_5, S-R_5, NR_4R_5; or, independently, together R_{1a} and R_{1b}, or R_{2a} and R_{2b}, or R_{3a} and R_{3b} are =O;

R_4, R_5 and R_6 are, independently, H; C_1 to C_{10} straight or branched chain lower alkyl or substituted lower alkyl; C_2 to C_{10} straight or branched chain lower alkenyl or substituted lower alkenyl; C_2 to C_{10} straight or branched chain lower alkynyl or substituted lower alkynyl; a ^{14}C containing lower alkyl, lower alkenyl or lower alkynyl; C_7 to C_{14} substituted or unsubstituted alkaryl or aralkyl; a ^{14}C containing C_7 to C_{14} alkaryl or aralkyl; C_6 to C_{14} aryl; alicyclic; heterocyclic; a reporter molecule; a group for improving the pharmacokinetic properties of an oligomer; or a group for improving the pharmacodynamic properties of an oligomer; and

where said substituents are OH, =O, CO_2 H, O-alkyl, SH, S-alkyl, NH-alkyl, N-$(alkyl)_2$, alkyl, F, Cl, Br, CN, CF_3, OCF_3, OCN, $SOCH_3$, SO_2CH_3, ONO_2, NO_2, N_3, NH_2, heterocycloalkyl, aryl, aralkyl, sulfide, silyl, intercalators, conjugates, imidazoles, amides, ester, ethers, carbonates, carbamates, ureas, polyamines, polyamides, polyethylene glycols or polyethers.

63. The composition of claim 35 wherein said non-phosphorous-containing internucleoside linkage is a linkage of one of the following formulas:



wherein

each W is independently selected from the group consisting of O, S, SO, SO_2, CH_2, CH, CO, CF_2, CS, N, NH and NR_3, and adjacent W's are not -O-O-, -O-S-, -O-CF_2-, or -S-CF_2-;

R_3 is methyl, ethyl, propyl, isopropyl, butyl or isobutyl;

each E is independently selected from the group consisting of O, S, SO, SO_2, CH, CH_2, CO, CF_2, CS, N, NH, and NR_3, and adjacent E's are not -O-O-, -O-S-, -S-O-, -O-CF_2-, -CF_2-O-, -CF_2-S- or -S-CF_2 -, and when E is CH or N, any adjacent E is CH or N or an adjacent J is CH and they are connected by a double bond;

J is selected from the group consisting of O, S, SO, SO_2, CH, CH_2, CO, CF_2 and CS, and adjacent -E-J-'s are not -O-O-, -O-S-, -S-O-, $-CF_2-O-$, $-O-CF_2-$, $-CF_2-S-$ or $-S-CF_2-$, and when J is CH, any adjacent E is CH or N and they are connected by a double bond;

each G is independently selected from the group consisting of C, CH, N, CF, CCl, CBr, CI, and CR_4;

R_4 is C1 to C4 alkyl, fluoromethyl, difluoromethyl, trifluoromethyl, hexafluoroisopropyl, 5-tetrazole, hydroxymethyl, CH_2-(5-tetrazole), CN, CO_2H, CO_2R_3, $CONH_2$, $CONHR_3$, $CON(R_3)_2$, CH_2SR_3, CH_2SOR_3, $CH_2SO_2R_3$, CH_2CO_2H, CH_2CN, $CH_2CO_2R_3$, CH_2CONH_2, CH_2CONHR_3 or $CH_2CON(R_3)_2$.

64. A pharmaceutical composition comprising the composition of claim 35 and a pharmaceutically acceptable carrier.

65. A method of modulating the expression of a target nucleic acid in a cell comprising contacting said cell with a composition of claim 35.

66. A method of treating or preventing a disease or disorder associated with a target nucleic acid comprising administering to an animal having or predisposed to said disease or disorder a therapeutically effective amount of a composition of claim 35.

67. An oligomer having at least a first region and a second region wherein:

said first region of said oligomer is complementary to and capable of hybridizing with said second region of said oligomer,

at least a portion of said oligomer is complementary to and capable of hybridizing to a selected target nucleic acid, and

said oligomer includes at least two nucleosides having a non-phosphorous-containing internucleoside linkage.

68. The oligomer of claim 67 wherein each of said first and said second regions is at least 10 nucleosidic bases.

69. The oligomer of claim 67 wherein said first region in a 5' to 3' direction is complementary to said second region in a 3' to 5' direction.

70. The oligomer of claim 67 wherein said oligomer includes a hairpin structure.

71. The oligomer of claim 67 wherein said first region of said oligomer is spaced from said second region of said oligomer by a third region and where said third region comprises at least two nucleosidic bases.

72. The oligomer of claim 67 wherein said first region of said oligomer is spaced from said second region of said oligomer by a third region and where said third region comprises a non-nucleosidic base region.

73. A pharmaceutical composition comprising the composition of claim 67 and a pharmaceutically acceptable carrier.

74. A method of modulating the expression of a target nucleic acid in a cell comprising contacting said cell with a composition of claim 67.

75. A method of treating or preventing a disease or disorder associated with a target nucleic acid comprising administering to an animal having or predisposed to said disease or disorder a therapeutically effective amount of a composition of claim 67.